1: Salmond RJ, Williams R, Hirst TR, Williams NA. Related Articles, Links

Selective induction of CD8+CD4- thymocyte apoptosis mediated by the B-subunit of Escherichia coli heat-labile enterotoxin.
Immunol Lett. 2003 Jul 3;88(1):43-6.
PMID: 12853160 [PubMed - in process]

2: Richards CM, Case R, Hirst TR, Hill TJ, Williams NA. Related Articles, Links

Protection against recurrent ocular herpes simplex virus type 1 disease after therapeutic vaccination of latently infected mice.
J Virol. 2003 Jun;77(12):6692-9.
PMID: 12767989 [PubMed - indexed for MEDLINE]

3: Ong KW, Wilson AD, Hirst TR, Morgan AJ. Related Articles, Links

The B subunit of Escherichia coli heat-labile enterotoxin enhances CD8+ cytotoxic-T-lymphocyte killing of Epstein-Barr virus-infected cell lines.
J Virol. 2003 Apr;77(7):4298-305.
PMID: 12634387 [PubMed - indexed for MEDLINE]

4: Fraser SA, de Haan L, Hearn AR, Bone HK, Salmond RJ, Rivett AJ, Williams NA, Hirst TR. Related Articles, Links

Mutant Escherichia coli heat-labile toxin B subunit that separates toxoid-mediated signaling and immunomodulatory action from trafficking and delivery functions.
Infect Immun. 2003 Mar;71(3):1527-37.
PMID: 12595472 [PubMed - indexed for MEDLINE]

5: Salmond RJ, Pitman RS, Jimi E, Soriani M, Hirst TR, Ghosh S, Rincon M, Williams NA. Related Articles, Links

CD8+ T cell apoptosis induced by Escherichia coli heat-labile enterotoxin B subunit occurs via a novel pathway involving NF-kappaB-dependent caspase activation.
Eur J Immunol. 2002 Jun;32(6):1737-47.
PMID: 12115657 [PubMed - indexed for MEDLINE]

6: Luross JA, Heaton T, Hirst TR, Day MJ, Williams NA. Related Articles, Links

Escherichia coli heat-labile enterotoxin B subunit prevents autoimmune arthritis through induction of regulatory CD4+ T cells.
Arthritis Rheum. 2002 Jun;46(6):1671-82.
PMID: 12115200 [PubMed - indexed for MEDLINE]

☐ **7:** Turcanu V, Hirst TR, Williams NA. Related Articles, Links

Modulation of human monocytes by Escherichia coli heat-labile enterotoxin B-subunit; altered cytokine production and its functional consequences.
Immunology. 2002 Jul;106(3):316-25.
PMID: 12100719 [PubMed - indexed for MEDLINE]

☐ **8:** Caney SM, Day MJ, Gruffydd-Jones TJ, Helps CR, Hirst TR, Stokes CR. Related Articles, Links

Expression of chemokine receptors in the feline reproductive tract and large intestine.
J Comp Pathol. 2002 May;126(4):289-302.
PMID: 12056777 [PubMed - indexed for MEDLINE]

☐ **9:** De Haan L, Hearn AR, Rivett AJ, Hirst TR. Related Articles, Links

Enhanced delivery of exogenous peptides into the class I antigen processing and presentation pathway.
Infect Immun. 2002 Jun;70(6):3249-58.
PMID: 12011020 [PubMed - indexed for MEDLINE]

☐ **10:** de Haan L, Hirst TR. Related Articles, Links

Bacterial toxins as versatile delivery vehicles.
Curr Opin Drug Discov Devel. 2002 Mar;5(2):269-78. Review.
PMID: 11926133 [PubMed - indexed for MEDLINE]

☐ **11:** Hirst TR, Fraser S, Soriani M, Aman AT, de HL, Hearn A, Merritt E. Related Articles, Links

New insights into the structure-function relationships and therapeutic applications of cholera-like enterotoxins.
Int J Med Microbiol. 2002 Feb;291(6-7):531-5. Review.
PMID: 11890554 [PubMed - indexed for MEDLINE]

☐ **12:** Soriani M, Bailey L, Hirst TR. Related Articles, Links

Contribution of the ADP-ribosylating and receptor-binding properties of cholera-like enterotoxins in modulating cytokine secretion by human intestinal epithelial cells.
Microbiology. 2002 Mar;148(Pt 3):667-76.
PMID: 11882700 [PubMed - indexed for MEDLINE]

☐ **13:** Lesieur C, Cliff MJ, Carter R, James RF, Clarke AR, Hirst TR. Related Articles, Links

A kinetic model of intermediate formation during assembly of cholera toxin B-subunit pentamers.
J Biol Chem. 2002 May 10;277(19):16697-704. Epub 2002 Mar 04.
PMID: 11877421 [PubMed - indexed for MEDLINE]

☐ **14:** Hirst TR. Related Articles, Links

Cholera. A toxin with emerging therapeutic potential.
Lancet. 2001 Dec;358 Suppl:S7. No abstract available.
PMID: 11784556 [PubMed - indexed for MEDLINE]

15: Rodighiero C, Fujinaga Y, Hirst TR, Lencer WI. Related Articles, Links

A cholera toxin B-subunit variant that binds ganglioside G(M1) but fails to induce toxicity.
J Biol Chem. 2001 Oct 5;276(40):36939-45. Epub 2001 Jul 30.
PMID: 11479294 [PubMed - indexed for MEDLINE]

16: Aman AT, Fraser S, Merritt EA, Rodigherio C, Kenny M, Ahn M, Hol WG, Williams NA, Lencer WI, Hirst TR. Related Articles, Links

A mutant cholera toxin B subunit that binds GM1- ganglioside but lacks immunomodulatory or toxic activity.
Proc Natl Acad Sci U S A. 2001 Jul 17;98(15):8536-41. Epub 2001 Jul 10.
PMID: 11447291 [PubMed - indexed for MEDLINE]

17: Soriani M, Williams NA, Hirst TR. Related Articles, Links

Escherichia coli enterotoxin B subunit triggers apoptosis of CD8(+) T cells by activating transcription factor c-myc.
Infect Immun. 2001 Aug;69(8):4923-30.
PMID: 11447169 [PubMed - indexed for MEDLINE]

18: Heyderman RS, Soriani M, Hirst TR. Related Articles, Links

Is immune cell activation the missing link in the pathogenesis of post-diarrhoeal HUS?
Trends Microbiol. 2001 Jun;9(6):262-6. Review.
PMID: 11390240 [PubMed - indexed for MEDLINE]

19: Millar DG, Hirst TR. Related Articles, Links

Cholera toxin and Escherichia coli enterotoxin B-subunits inhibit macrophage-mediated antigen processing and presentation: evidence for antigen persistence in non-acidic recycling endosomal compartments.
Cell Microbiol. 2001 May;3(5):311-29.
PMID: 11298654 [PubMed - indexed for MEDLINE]

20: Millar DG, Hirst TR, Snider DP. Related Articles, Links

Escherichia coli heat-labile enterotoxin B subunit is a more potent mucosal adjuvant than its vlosely related homologue, the B subunit of cholera toxin.
Infect Immun. 2001 May;69(5):3476-82.
PMID: 11292779 [PubMed - indexed for MEDLINE]

21: Richards CM, Aman AT, Hirst TR, Hill TJ, Williams NA. Related Articles, Links

Protective mucosal immunity to ocular herpes simplex virus type 1 infection in mice by using Escherichia coli heat-labile enterotoxin B subunit as an adjuvant.
J Virol. 2001 Feb;75(4):1664-71.
PMID: 11160664 [PubMed - indexed for MEDLINE]

22: Badizadegan K, Wolf AA, Rodighiero C, Jobling M, Hirst TR, Holmes RK, Lencer WI. Related Articles, Links

Floating cholera toxin into epithelial cells: functional association with caveolae-like detergent-insoluble membrane microdomains.
Int J Med Microbiol. 2000 Oct;290(4-5):403-8. Review.
PMID: 11111918 [PubMed - indexed for MEDLINE]

23: Ascencio F, Hirst TR, Wadstrom T. Related Articles, Links

Production and secretion of collagen-binding proteins from Aeromonas veronii.
J Appl Microbiol. 2000 Oct;89(4):607-16.
PMID: 11054164 [PubMed - indexed for MEDLINE]

24: de Haan L, Hirst TR. Related Articles, Links

Cholera toxin and related enterotoxins: a cell biological and immunological perspective.
J Nat Toxins. 2000 Aug;9(3):281-97. Review.
PMID: 10994530 [PubMed - indexed for MEDLINE]

25: Lencer WI, Hirst TR, Holmes RK. Related Articles, Links

Membrane traffic and the cellular uptake of cholera toxin.
Biochim Biophys Acta. 1999 Jul 8;1450(3):177-90. Review.
PMID: 10395933 [PubMed - indexed for MEDLINE]

26: Loregian A, Papini E, Satin B, Marsden HS, Hirst TR, Palu G. Related Articles, Links

Intranuclear delivery of an antiviral peptide mediated by the B subunit of Escherichia coli heat-labile enterotoxin.
Proc Natl Acad Sci U S A. 1999 Apr 27;96(9):5221-6.
PMID: 10220447 [PubMed - indexed for MEDLINE]

27: Hayward CM, O'Gaora P, Young DB, Griffin GE, Thole J, Hirst TR, Castello-Branco LR, Lewis DJ. Related Articles, Links

Construction and murine immunogenicity of recombinant Bacille Calmette Guerin vaccines expressing the B subunit of Escherichia coli heat labile enterotoxin.
Vaccine. 1999 Mar 5;17(9-10):1272-81.
PMID: 10195640 [PubMed - indexed for MEDLINE]

28: Williams NA, Hirst TR, Nashar TO. Related Articles, Links

Immune modulation by the cholera-like enterotoxins: from adjuvant to therapeutic.
Immunol Today. 1999 Feb;20(2):95-101. Review.
PMID: 10098329 [PubMed - indexed for MEDLINE]

29: Stark RM, Gerwig GJ, Pitman RS, Potts LF, Williams NA, Greenman J, Weinzweig IP, Hirst TR, Millar MR. Related Articles, Links

Biofilm formation by Helicobacter pylori.
Lett Appl Microbiol. 1999 Feb;28(2):121-6.
PMID: 10063642 [PubMed - indexed for MEDLINE]

30: Rodighiero C, Aman AT, Lencer WI, Hirst TR. Related Articles, Links

Differential activity of cholera toxin and E. coli enterotoxin: construction and purification of mutant and hybrid derivatives.
Biochem Soc Trans. 1998 Nov;26(4):S364. No abstract available.
PMID: 10047878 [PubMed - indexed for MEDLINE]

31: Pitman RS, Hirst TR, Nashar TO, Williams NA. Related Articles, Links

Receptor mediated apoptosis of CD8+T cells by the B subunits of cholera-like enterotoxins.
Biochem Soc Trans. 1998 Nov;26(4):S338. No abstract available.
PMID: 10047852 [PubMed - indexed for MEDLINE]

32: Rodighiero C, Aman AT, Kenny MJ, Moss J, Lencer WI, Hirst TR. Related Articles, Links

Structural basis for the differential toxicity of cholera toxin and Escherichia coli heat-labile enterotoxin. Construction of hybrid toxins identifies the A2-domain as the determinant of differential toxicity.
J Biol Chem. 1999 Feb 12;274(7):3962-9.
PMID: 9933586 [PubMed - indexed for MEDLINE]

33: Hirst TR, Nashar TO, Pitman RS, Williams NA. Related Articles, Links

Cholera toxin and related enterotoxins as potent immune modulators.
Symp Ser Soc Appl Microbiol. 1998;27:26S-34S. Review. No abstract available.
PMID: 9750359 [PubMed - indexed for MEDLINE]

34: Nashar TO, Williams NA, Hirst TR. Related Articles, Links

Importance of receptor binding in the immunogenicity, adjuvanticity and therapeutic properties of cholera toxin and Escherichia coli heat-labile enterotoxin.
Med Microbiol Immunol (Berl). 1998 Jun;187(1):3-10. Review. No abstract available.
PMID: 9749977 [PubMed - indexed for MEDLINE]

35: Nashar TO, Hirst TR, Williams NA. Related Articles, Links

Modulation of B-cell activation by the B subunit of Escherichia coli enterotoxin: receptor interaction up-regulates MHC class II, B7, CD40, CD25 and ICAM-1.
Immunology. 1997 Aug;91(4):572-8.
PMID: 9378497 [PubMed - indexed for MEDLINE]

36: Lloyd JR, Hirst TR, Bunch AW. Related Articles, Links

Hollow-fire bioreactors compared to batch and chemostat culture for the production of a recombinant toxoid by a marine Iibrio.
Appl Microbiol Biotechnol. 1997 Aug;48(2):155-61.
PMID: 9299772 [PubMed - indexed for MEDLINE]

37: Merritt EA, Sarfaty S, Jobling MG, Chang T, Holmes RK, Hirst TR, Hol WG. Related Articles, Links

Structural studies of receptor binding by cholera toxin mutants.
Protein Sci. 1997 Jul;6(7):1516-28.
PMID: 9232653 [PubMed - indexed for MEDLINE]

☐ **38:** Lencer WI, Constable C, Moe S, Rufo PA, Wolf A, Jobling MG, Ruston SP, Madara JL, Holmes RK, Hirst TR. Related Articles, Links

Proteolytic activation of cholera toxin and Escherichia coli labile toxin by entry into host epithelial cells. Signal transduction by a protease-resistant toxin variant.
J Biol Chem. 1997 Jun 13;272(24):15562-8.
PMID: 9182593 [PubMed - indexed for MEDLINE]

☐ **39:** Williams NA, Stasiuk LM, Nashar TO, Richards CM, Lang AK, Day MJ, Hirst TR. Related Articles, Links

Prevention of autoimmune disease due to lymphocyte modulation by the B-subunit of Escherichia coli heat-labile enterotoxin.
Proc Natl Acad Sci U S A. 1997 May 13;94(10):5290-5.
PMID: 9144230 [PubMed - indexed for MEDLINE]

☐ **40:** Ruddock LW, Webb HM, Ruston SP, Cheesman C, Freedman RB, Hirst TR. Related Articles, Links

A pH-dependent conformational change in the B-subunit pentamer of Escherichia coli heat-labile enterotoxin: structural basis and possible functional role for a conserved feature of the AB5 toxin family.
Biochemistry. 1996 Dec 17;35(50):16069-76.
PMID: 8973177 [PubMed - indexed for MEDLINE]

☐ **41:** Karlsson KA, Teneberg S, Angstrom J, Kjellberg A, Hirst TR, Berstrom J, Miller-Podraza H. Related Articles, Links

Unexpected carbohydrate cross-binding by Escherichia coli heat-labile enterotoxin. Recognition of human and rabbit target cell glycoconjugates in comparison with cholera toxin.
Bioorg Med Chem. 1996 Nov;4(11):1919-28.
PMID: 9007276 [PubMed - indexed for MEDLINE]

☐ **42:** Loregian A, Hirst TR, Marsden HS, Palu G. Related Articles, Links

Use of Vibrio spp. for expression of Escherichia coli enterotoxin B subunit fusion proteins: purification and characterization of a chimera containing a C-terminal fragment of DNA polymerase from herpes simplex virus type 1.
Protein Expr Purif. 1996 Nov;8(3):381-9.
PMID: 8936601 [PubMed - indexed for MEDLINE]

☐ **43:** Ruddock LW, Coen JJ, Cheesman C, Freedman RB, Hirst TR. Related Articles, Links

Assembly of the B subunit pentamer of Escherichia coli heat-labile enterotoxin. Kinetics and molecular basis of rate-limiting steps in vitro.
J Biol Chem. 1996 Aug 9;271(32):19118-23. Erratum in: J Biol Chem 1996 Oct 25;271(43):27188.
PMID: 8702586 [PubMed - indexed for MEDLINE]

☐ **44:** Green EA, Botting C, Webb HM, Hirst TR, Randall RE. Related Articles, Links

Construction, purification and immunogenicity of antigen-antibody-LTB complexes.
Vaccine. 1996 Jul;14(10):949-58.
PMID: 8873387 [PubMed - indexed for MEDLINE]

45: Nashar TO, Williams NA, Hirst TR, Nahar TO. Related Articles, Links

Cross-linking of cell surface ganglioside GM1 induces the selective apoptosis of mature CD8+ T lymphocytes.
Int Immunol. 1996 May;8(5):731-6. Review. Erratum in: Int Immunol. 2003 Mar;15(3):456..
PMID: 8671661 [PubMed - indexed for MEDLINE]

46: Ruddock LW, Hirst TR, Freedman RB. Related Articles, Links

pH-dependence of the dithiol-oxidizing activity of DsbA (a periplasmic protein thiol:disulphide oxidoreductase) and protein disulphide-isomerase: studies with a novel simple peptide substrate.
Biochem J. 1996 May 1;315 (Pt 3):1001-5.
PMID: 8645136 [PubMed - indexed for MEDLINE]

47: Marcello A, Loregian A, De Filippis V, Fontana A, Hirst TR, Palu G. Related Articles, Links

Identification and characterization of an extracellular protease activity produced by the marine Vibrio sp. 60.
FEMS Microbiol Lett. 1996 Feb 1;136(1):39-44.
PMID: 8919453 [PubMed - indexed for MEDLINE]

48: Nashar TO, Webb HM, Eaglestone S, Williams NA, Hirst TR. Related Articles, Links

Potent immunogenicity of the B subunits of Escherichia coli heat-labile enterotoxin: receptor binding is essential and induces differential modulation of lymphocyte subsets.
Proc Natl Acad Sci U S A. 1996 Jan 9;93(1):226-30.
PMID: 8552610 [PubMed - indexed for MEDLINE]

49: Ruddock LW, Ruston SP, Kelly SM, Price NC, Freedman RB, Hirst TR. Related Articles, Links

Kinetics of acid-mediated disassembly of the B subunit pentamer of Escherichia coli heat-labile enterotoxin. Molecular basis of pH stability.
J Biol Chem. 1995 Dec 15;270(50):29953-8.
PMID: 8530395 [PubMed - indexed for MEDLINE]

50: Hirst TR, Hillary JB, Ruddock LW, Yu J. Related Articles, Links

Translocation of folded proteins across bacterial outer membranes: a novel secretory phenomenon.
Biochem Soc Trans. 1995 Nov;23(4):985-91. Review. No abstract available.
PMID: 8654880 [PubMed - indexed for MEDLINE]

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51: Lencer WI, Constable C, Moe S, Jobling MG, Webb HM, Ruston S, Madara JL, Hirst TR, Holmes RK. Related Articles, Links

Targeting of cholera toxin and Escherichia coli heat labile toxin in polarized epithelia: role of COOH-terminal KDEL.
J Cell Biol. 1995 Nov;131(4):951-62.
PMID: 7490296 [PubMed - indexed for MEDLINE]

52: Amin T, Larkins A, James RF, Hirst TR. Related Articles, Links

Generation of a monoclonal antibody that recognizes the amino-terminal decapeptide of the B-subunit of Escherichia coli heat-labile enterotoxin. A new probe for studying toxin assembly intermediates.
J Biol Chem. 1995 Aug 25;270(34):20143-50.
PMID: 7544352 [PubMed - indexed for MEDLINE]

53: Nashar TO, Hirst TR. Related Articles, Links

Immunoregulatory role of H-2 and intra-H-2 alleles on antibody responses to recombinant preparations of B-subunits of Escherichia coli heat-labile enterotoxin (rEtxB) and cholera toxin (rCtxB).
Vaccine. 1995 Jun;13(9):803-10.
PMID: 7483801 [PubMed - indexed for MEDLINE]

54: Lowe ED, Freedman RB, Hirst TR, Barth PT. Related Articles, Links

Cloning and expression of Vibrio cholerae dsbA, a gene encoding a periplasmic protein disulphide isomerase.
Biochem Soc Trans. 1995 Feb;23(1):64S. No abstract available.
PMID: 7758780 [PubMed - indexed for MEDLINE]

55: Loregian A, Marcello A, Hirst TR, Marsden HS, Palu G. Related Articles, Links

Construction of a fusion protein between B subunit of E. coli heat-labile enterotoxin and the C-terminus of herpes simplex virus-DNA polymerase.
Biochem Soc Trans. 1995 Feb;23(1):61S. No abstract available.
PMID: 7758777 [PubMed - indexed for MEDLINE]

56: Ruston S, Eaglestone S, Webb H, Hirst TR. Related Articles, Links

Strategies for the purification of intact and proteolytically-activated native and engineered heat-labile enterotoxins of Escherichia coli.
Biochem Soc Trans. 1995 Feb;23(1):55S. No abstract available.
PMID: 7758771 [PubMed - indexed for MEDLINE]

57: Eaglestone S, Hirst TR. Related Articles, Links

Preparation of a fusion protein for vaccination against Escherichia coli enterotoxins.
Biochem Soc Trans. 1995 Feb;23(1):54S. No abstract available.
PMID: 7758770 [PubMed - indexed for MEDLINE]

58: Yu J, Hirst TR. Related Articles, Links

A pleiotropic secretion mutant of Aeromonas hydrophila is unable to secrete heterologously expressed E. coli enterotoxin: implication for common mechanisms of protein secretion.
Biochem Soc Trans. 1995 Feb;23(1):34S. No abstract available.
PMID: 7758745 [PubMed - indexed for MEDLINE]

59: Teneberg S, Hirst TR, Angstrom J, Karlsson KA. Related Articles, Links

Comparison of the glycolipid-binding specificities of cholera toxin and porcine Escherichia coli heat-labile enterotoxin: identification of a receptor-active non-ganglioside glycolipid for the heat-labile toxin in infant rabbit small intestine.
Glycoconj J. 1994 Dec;11(6):533-40.
PMID: 7696856 [PubMed - indexed for MEDLINE]

60: Marcello A, Loregian A, Cross A, Marsden H, Hirst TR, Palu G. Related Articles, Links

Specific inhibition of herpes virus replication by receptor-mediated entry of an antiviral peptide linked to Escherichia coli enterotoxin B subunit.
Proc Natl Acad Sci U S A. 1994 Sep 13;91(19):8994-8.
PMID: 8090758 [PubMed - indexed for MEDLINE]

61: Freedman RB, Hirst TR, Tuite MF. Related Articles, Links

Protein disulphide isomerase: building bridges in protein folding.
Trends Biochem Sci. 1994 Aug;19(8):331-6. Review.
PMID: 7940678 [PubMed - indexed for MEDLINE]

62: Hirst TR, Nashar TO, Eaglestone S, Lencer WI, Webb HM, Yu J. Related Articles, Links

Bacterial and host interactions during the biogenesis, toxicity and immunogenicity of Escherichia coli heat-labile enterotoxin.
Biochem Soc Trans. 1994 May;22(2):306-9. Review. No abstract available.
PMID: 7958313 [PubMed - indexed for MEDLINE]

☐ **63:** Amin T, Hirst TR. Related Articles, Links

Purification of the B-subunit oligomer of Escherichia coli heat-labile enterotoxin by heterologous expression and secretion in a marine vibrio.
Protein Expr Purif. 1994 Apr;5(2):198-204.
PMID: 8054855 [PubMed - indexed for MEDLINE]

☐ **64:** Marcello A, Loregian A, Palu G, Hirst TR. Related Articles, Links

Efficient extracellular production of hybrid E. coli heat-labile enterotoxin B subunits in a marine Vibrio.
FEMS Microbiol Lett. 1994 Mar 15;117(1):47-51.
PMID: 8181710 [PubMed - indexed for MEDLINE]

☐ **65:** Findlay G, Hirst TR. Related Articles, Links

Escherichia coli and Vibrio cholerae strains deficient in an enzyme involved in disulphide bond formation (DsbA) show an increase in sensitivity to dithiothreitol.
Biochem Soc Trans. 1994 Feb;22(1):77S. No abstract available.
PMID: 8206309 [PubMed - indexed for MEDLINE]

☐ **66:** Amin T, Marcello A, Hirst TR. Related Articles, Links

A new method for the purification of the B subunit (EtxB) of Escherichia coli heat-labile enterotoxin.
Biochem Soc Trans. 1993 May;21(2):213S. No abstract available.
PMID: 8359463 [PubMed - indexed for MEDLINE]

☐ **67:** Findlay G, Yu J, Hirst TR. Related Articles, Links

Analysis of enterotoxin synthesis in a Vibrio cholerae strain lacking DsbA, a periplasmic enzyme involved in disulphide bond formation.
Biochem Soc Trans. 1993 May;21(2):212S. No abstract available.
PMID: 8359462 [PubMed - indexed for MEDLINE]

☐ **68:** Yu J, McLaughlin S, Freedman RB, Hirst TR. Related Articles, Links

Cloning and active site mutagenesis of Vibrio cholerae DsbA, a periplasmic enzyme that catalyzes disulfide bond formation.
J Biol Chem. 1993 Feb 25;268(6):4326-30.
PMID: 8440717 [PubMed - indexed for MEDLINE]

☐ **69:** Aitken R, Hirst TR. Related Articles, Links

Recombinant enterotoxins as vaccines against Escherichia coli-mediated diarrhoea.
Vaccine. 1993;11(2):227-33.
PMID: 8438620 [PubMed - indexed for MEDLINE]

☐ **70:** Nashar TO, Amin T, Marcello A, Hirst TR. Related Articles, Links

Current progress in the development of the B subunits of cholera toxin and Escherichia coli heat-labile enterotoxin as carriers for the oral delivery of heterologous antigens and epitopes.
Vaccine. 1993;11(2):235-40. Review.
PMID: 7679865 [PubMed - indexed for MEDLINE]

71: Streatfield SJ, Sandkvist M, Sixma TK, Bagdasarian M, Hol WG, Hirst TR. Related Articles, Links

Intermolecular interactions between the A and B subunits of heat-labile enterotoxin from Escherichia coli promote holotoxin assembly and stability in vivo.
Proc Natl Acad Sci U S A. 1992 Dec 15;89(24):12140-4.
PMID: 1465452 [PubMed - indexed for MEDLINE]

72: Marcello A, Palu G, Hirst TR. Related Articles, Links

E. coli heat-labile enterotoxin B subunit as a carrier for delivery of a peptide with anti-HSV activity.
Biochem Soc Trans. 1992 Nov;20(4):311S. No abstract available.
PMID: 1336736 [PubMed - indexed for MEDLINE]

73: Yu J, Webb H, Hirst TR. Related Articles, Links

A homologue of the Escherichia coli DsbA protein involved in disulphide bond formation is required for enterotoxin biogenesis in Vibrio cholerae.
Mol Microbiol. 1992 Jul;6(14):1949-58.
PMID: 1324389 [PubMed - indexed for MEDLINE]

74: Leece R, Hirst TR. Related Articles, Links

Expression of the B subunit of Escherichia coli heat-labile enterotoxin in a marine Vibrio and in a mutant that is pleiotropically defective in the secretion of extracellular proteins.
J Gen Microbiol. 1992 Apr;138 (Pt 4):719-24.
PMID: 1588306 [PubMed - indexed for MEDLINE]

75: Aitken R, Hirst TR. Related Articles, Links

Development of an immunoassay using recombinant maltose-binding protein-STa fusions for quantitating antibody responses against STa, the heat-stable enterotoxin of Escherichia coli.
J Clin Microbiol. 1992 Mar;30(3):732-4.
PMID: 1551993 [PubMed - indexed for MEDLINE]

76: Schonberger O, Hirst TR, Pines O. Related Articles, Links

Targeting and assembly of an oligomeric bacterial enterotoxoid in the endoplasmic reticulum of Saccharomyces cerevisiae.
Mol Microbiol. 1991 Nov;5(11):2663-71.
PMID: 1779757 [PubMed - indexed for MEDLINE]

77: Hirst TR, Leece R. Related Articles, Links

The phenomenon of toxin secretion by vibrios and aeromonads.
Experientia. 1991 May 15;47(5):429-31. Review.
PMID: 2044692 [PubMed - indexed for MEDLINE]

78: Sandkvist M, Hirst TR, Bagdasarian M. Related Articles, Links

Minimal deletion of amino acids from the carboxyl terminus of the B subunit of heat-labile enterotoxin causes defects in its assembly and release from the cytoplasmic membrane of Escherichia coli.
J Biol Chem. 1990 Sep 5;265(25):15239-44.
PMID: 2203772 [PubMed - indexed for MEDLINE]

79: Hardy SJ, Holmgren J, Johansson S, Sanchez J, Hirst TR. Related Articles, Links

Coordinated assembly of multisubunit proteins: oligomerization of bacterial enterotoxins in vivo and in vitro.
Proc Natl Acad Sci U S A. 1988 Oct;85(19):7109-13.
PMID: 3050987 [PubMed - indexed for MEDLINE]

80: Hirst TR, Welch RA. Related Articles, Links

Mechanisms for secretion of extracellular proteins by gram-negative bacteria.
Trends Biochem Sci. 1988 Jul;13(7):265-9. Review. No abstract available.
PMID: 3076724 [PubMed - indexed for MEDLINE]

81: Sanchez J, Hirst TR, Uhlin BE. Related Articles, Links

Hybrid enterotoxin LTA::STa proteins and their protection from degradation by in vivo association with B-subunits of Escherichia coli heat-labile enterotoxin.
Gene. 1988 Apr 29;64(2):265-75.
PMID: 2841198 [PubMed - indexed for MEDLINE]

82: Hirst TR, Holmgren J. Related Articles, Links

Conformation of protein secreted across bacterial outer membranes: a study of enterotoxin translocation from Vibrio cholerae.
Proc Natl Acad Sci U S A. 1987 Nov;84(21):7418-22.
PMID: 3478701 [PubMed - indexed for MEDLINE]

83: Sandkvist M, Hirst TR, Bagdasarian M. Related Articles, Links

Alterations at the carboxyl terminus change assembly and secretion properties of the B subunit of Escherichia coli heat-labile enterotoxin.
J Bacteriol. 1987 Oct;169(10):4570-6.
PMID: 2820934 [PubMed - indexed for MEDLINE]

84: Hirst TR, Holmgren J. Related Articles, Links

Transient entry of enterotoxin subunits into the periplasm occurs during their secretion from Vibrio cholerae.
J Bacteriol. 1987 Mar;169(3):1037-45.
PMID: 3493239 [PubMed - indexed for MEDLINE]

85: Sanchez J, Uhlin BE, Grundstrom T, Holmgren J, Hirst TR. Related Articles, Links

Immunoactive chimeric ST-LT enterotoxins of Escherichia coli generated by in vitro gene fusion.
FEBS Lett. 1986 Nov 24;208(2):194-8.
PMID: 2430831 [PubMed - indexed for MEDLINE]

86: Harkki A, Hirst TR, Holmgren J, Palva ET. Related Articles, Links

Expression of the Escherichia coli lamB gene in Vibrio cholerae.
Microb Pathog. 1986 Jun;1(3):283-8.
PMID: 2977630 [PubMed - indexed for MEDLINE]

87: Hirst TR, Sanchez J, Kaper JB, Hardy SJ, Holmgren J. Related Articles, Links

Mechanism of toxin secretion by Vibrio cholerae investigated in strains harboring plasmids that encode heat-labile enterotoxins of Escherichia coli.
Proc Natl Acad Sci U S A. 1984 Dec;81(24):7752-6.
PMID: 6393126 [PubMed - indexed for MEDLINE]

88: Hirst TR, Randall LL, Hardy SJ. Related Articles, Links

Cellular location of enterotoxin in Escherichia coli.
Biochem Soc Trans. 1984 Apr;12(2):189-91. No abstract available.
PMID: 6373432 [PubMed - indexed for MEDLINE]

89: Hirst TR, Randall LL, Hardy SJ. Related Articles, Links

Cellular location of heat-labile enterotoxin in Escherichia coli.
J Bacteriol. 1984 Feb;157(2):637-42.
PMID: 6363391 [PubMed - indexed for MEDLINE]

90: Hirst TR, Hardy SJ, Randall LL. Related Articles, Links

Assembly in vivo of enterotoxin from Escherichia coli: formation of the B subunit oligomer.
J Bacteriol. 1983 Jan;153(1):21-6. No abstract available.
PMID: 6336733 [PubMed - indexed for MEDLINE]

91: Enequist HG, Hirst TR, Harayama S, Hardy SJ, Randall LL. Related Articles, Links

Energy is required for maturation of exported proteins in Escherichia coli.
Eur J Biochem. 1981 May 15;116(2):227-33.
PMID: 7018904 [PubMed - indexed for MEDLINE]

92: Palva ET, Hirst TR, Hardy SJ, Holmgren J, Randall L. Related Articles, Links

Synthesis of a precursor to the B subunit of heat-labile enterotoxin in Escherichia coli.
J Bacteriol. 1981 Apr;146(1):325-30.
PMID: 6260742 [PubMed - indexed for MEDLINE]

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1: Vaccine. 1995 Jun;13(9):803-10.

Immunoregulatory role of H-2 and intra-H-2 alleles on antibody responses to recombinant preparations of B-subunits of Escherichia coli heat-labile enterotoxin (rEtxB) and cholera toxin (rCtxB).

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The immunoregulatory role of H-2 and intra-H-2 alleles on antibody responses to recombinant preparations of B-subunits of Escherichia coli heat-labile enterotoxin (rEtxB) and cholera toxin (rCtxB) is reported. Oral delivery of rEtxB to congenic mice of several different H-2 haplotypes resulted in H-2 dependent serum IgG responses (H-2d > H-2b = H-2q > H-2a > H-2k) and a similar spectrum of intestinal IgA responses in those strains tested. Responses to rEtxB and rCtxB were found to be differentially modulated by the H-2 locus, with significant differential effects in H-2b and H-2d congenic strains (H-2d > H-2b for rEtxB; H-2b > H-2d for rCtxB). Additionally, it was found that when rEtxB was fed to mice previously primed (orally) with either rEtxB or rCtxB only those mice primed with rEtxB exhibited a booster response. A second booster immunisation with rEtxB in rCtxB-primed mice produced an H-2 dependent spectrum of responses characteristic of those elicited by rEtxB, with the antibodies predominantly directed against rEtxB and not rCtxB. These results indicate that the differential response to rEtxB and rCtxB is set at the T- and B-cell level. Also, immunoregulation of antibody responses to rEtxB by intra-H-2 I-E in mice transgenic for the entire IEka gene was investigated. No significant difference between responses in transgene-positive and -negative mice was found, suggesting that antigen presentation does not involve I-E, but occurs in the context of I-A.(ABSTRACT TRUNCATED AT 250 WORDS)

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Protective Mucosal Immunity to Ocular Herpes Simplex Virus Type 1 Infection in Mice by Using *Escherichia coli* Heat-Labile Enterotoxin B Subunit as an Adjuvant

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The potential of nontoxic recombinant B subunits of cholera toxin (rCtxB) and its close relative *Escherichia coli* heat-labile enterotoxin (rEtxB) to act as mucosal adjuvants for intranasal immunization with herpes simplex virus type 1 (HSV-1) glycoproteins was assessed. Doses of 10 μg of rEtxB or above with 10 μg of HSV-1 glycoproteins elicited high serum and mucosal anti-HSV-1 titers comparable with that obtained using CtxB (10 μg) with a trace (0.5 μg) of whole toxin (Ctx-CtxB). By contrast, doses of rCtxB up to 100 μg elicited only meager anti-HSV-1 responses. As for Ctx-CtxB, rEtxB resulted in a Th2-biased immune response with high immunoglobulin G1 (IgG1)/IgG2a antibody ratios and production of interleukin 4 (IL-4) and IL-10 as well as gamma interferon by proliferating T cells. The protective efficacy of the immune response induced using rEtxB as an adjuvant was assessed following ocular challenge of immunized and mock-immunized mice. Epithelial disease was observed in both groups, but the immunized mice recovered by day 6 whereas mock-immunized mice developed more severe corneal disease leading to stromal keratitis. In addition, a significant reduction in the incidence of lid disease and zosteriform spread was observed in immunized animals and there was no encephalitis compared with 95% encephalitis in mock-immunized mice. The potential of such mucosal adjuvants for use in human vaccines against pathogens such as HSV-1 is discussed.

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0022-538X/01/$04.00+0 DOI: 10.1128/JVI.75.4.1664-1671.2001

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- Ong, K.-W., Wilson, A. D., Hirst, T. R., Morgan, A. J. (2003). The B Subunit of Escherichia coli Heat-Labile Enterotoxin Enhances CD8+ Cytotoxic-T-Lymphocyte Killing of Epstein-Barr Virus-Infected Cell Lines. *J. Virol.* 77: 4298-4305 [Abstract] [Full Text]
- Fraser, S. A., de Haan, L., Hearn, A. R., Bone, H. K., Salmond, R. J., Rivett, A. J., Williams, N. A., Hirst, T. R. (2003). Mutant Escherichia coli Heat-Labile Toxin B Subunit That Separates Toxoid-Mediated Signaling and Immunomodulatory Action from Trafficking and Delivery Functions. *Infect. Immun.* 71: 1527-1537 [Abstract] [Full Text]
- Bone, H., Eckholdt, S., Williams, N. A. (2002). Modulation of B lymphocyte signalling by the B subunit of Escherichia coli heat-labile enterotoxin. *Int Immunol* 14: 647-658 [Abstract] [Full Text]
- Lesieur, C., Cliff, M. J., Carter, R., James, R. F. L., Clarke, A. R., Hirst, T. R. (2002). A Kinetic Model of Intermediate Formation during Assembly of Cholera Toxin B-subunit Pentamers. *J. Biol. Chem.* 277: 16697-16704 [Abstract] [Full Text]
- Soriani, M., Bailey, L., Hirst, T. R. (2002). Contribution of the ADP-ribosylating and receptor-binding properties of cholera-like enterotoxins in modulating cytokine secretion by human intestinal epithelial cells. *Microbiology* 148: 667-676 [Abstract] [Full Text]
- Rodighiero, C., Fujinaga, Y., Hirst, T. R., Lencer, W. I. (2001). A Cholera Toxin B-subunit Variant That Binds Ganglioside GM1 but Fails to Induce Toxicity. *J. Biol. Chem.* 276: 36939-36945 [Abstract] [Full Text]
- Aman, A. T., Fraser, S., Merritt, E. A., Rodigherio, C., Kenny, M., Ahn, M., Hol, W. G. J., Williams, N. A., Lencer, W. I., Hirst, T. R. (2001). A mutant cholera toxin B subunit that binds GM1- ganglioside but lacks immunomodulatory or toxic activity. *Proc. Natl. Acad. Sci. U. S. A.* 98: 8536-8541 [Abstract] [Full Text]
- Millar, D. G., Hirst, T. R., Snider, D. P. (2001). Escherichia coli Heat-Labile Enterotoxin B Subunit Is a More Potent Mucosal Adjuvant than Its Closely Related Homologue, the B Subunit of Cholera Toxin. *Infect. Immun.* 69: 3476-3482 [Abstract] [Full Text]